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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,021

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BROOK-LEVI3

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EXAMINER

MELLON, DAVID C

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

05/08/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,021	BROOK-LEVINSON ET AL.	
	Examiner	Art Unit	
	DAVID C. MELLON	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 8,9,18,20 and 31-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,10-17,19 and 21-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20070411</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, Claims 1-30, Species A-2, and Species B-1 in the reply filed on 2/26/2009 is acknowledged. The traversal is on the ground(s) that the examiner has interpreted the general inventive concept too narrowly. Additionally, that the examiner has not sufficiently considered generic claims present in the application. This is not found persuasive because the applicant has not specifically pointed out any alleged errors in the restriction requirement. Furthermore, the applicant has not distinguished any generic claims which would cause any reason to withdraw a species requirement. Furthermore, applicant has not established how generic claims have any impact upon the restriction requirement as currently made.

If applicant is attempting to state that the inventions are not patentably distinct, applicant should have submitted evidence or identify such evidence, now of record, showing the inventions to be obvious variants of each other, or clearly admit on the record that this is the case.

2. Additionally, claims 8-9, 18, and 20 are further withdrawn as drawn to non-elected species.

Claims 8 and 9 are drawn to a non-elected species A-1 regarding adding ferromagnetic particles non-simultaneously with the basic coagulant. Claim 18 is drawn to non-elected species B-2 of adding a second oxidizer after flocculation. Claim 20 is drawn to non-elected species B-2 of adding the second oxidizer after flocculation.

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3. Claims 8-9, 18, 20, and 31-40 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention and species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 2/26/2009.

The requirement is still deemed proper and is therefore made FINAL.

Specification

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-7, 10-17, 19, and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Axnas (USP 5,202,030) in view of Horvath (USP 4,049,545) and further in view of Liu (USP 5,685,993).

Regarding claim 1, Axnas discloses a method for treating industrial wastewater (C1/L5-12), comprising:

- introducing powder of a ferromagnetic particulate material into the wastewater in an amount effective to provide magnetic susceptibility to sludge (C1/L33-35);
- adjusting a value of a pH of the wastewater by adding basic coagulant, thereby elevating the value of the pH of the wastewater to a first predetermined value of the pH (C3/L20-22;
- oxidizing the wastewater having an adjusted value of the pH (C3/L21-23);

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- flocculating the wastewater by adding at least one flocculant agent selected from cationic flocculant and anionic flocculant, to form flakes of the magnetic sludge in water (C3/L23-27); and

Axnas does not explicitly set forth adding acidic coagulant or separating magnetic sludge from the water.

Horvath discloses a chemical waste water treatment method (title) in which a coagulant aid is added to waste water, the pH is increased with a basic precipitating agent, then decreased with an acidic agent to neutral. The wastewater is then oxidized twice using oxidization treatments (see figure 1, also C3/L30-42, C4/L45-60, C5/L34-60, C6/L60-69, and alos C7/L35-55).

Axnas and Horvath are combinable because they are concerned with the same field of endeavor, namely that of chemical or industrial wastewater treatment.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Axnas to replace the oxidizing steps and further include the acid coagulation step of Horvath for the purpose of producing a pure water product at a neutral pH which is readily disposable or reusable.

Liu discloses a process for removal of heavy metal ions by ferrite co-precipitation from an aqueous solution. Liu further discloses a magnetic separator (116) in figure 1.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Axnas to further include a magnetic separator to remove magnetic flocs from the water as taught by Liu for the purpose of removing and recovering flocculated magnetic sludge so as to produce pure, clean water.

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Regarding claim 2, Axnas further discloses wherein the wastewater includes at least one component selected from heavy metals, oil products, detergents, phenols, dyes, complexions, and complexionates (C3/L35-40, see also C2/L13-35, "phenols" for instance).

Regarding claim 3, Axnas further discloses finely ground magnetic particles (C3/L5-12). While Axnas does not explicitly disclose particle size of 1-100 microns, it would have been obvious to one having ordinary skill in the art to have chosen to grind the particles to a fine size of 1-100 microns for the purpose of improved dispersion of particles into the wastewater solution. Furthermore, Applicant has not established a criticality of the particle size or that using particles of a different size changes the method such that unexpected results occur when using such a fine grind size. Additionally, it has been held that where the general conditions of a claim are disclosed in the prior art (in this case the finely ground particles), discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 4, Axnas further discloses wherein of said ferromagnetic particulate material is made of ferrites of heavy metals (C3/L5-10, "magnetite").

Regarding claim 5, Axnas further discloses wherein the ferrites include magnetite (C3/L5-10).

Regarding claim 6, modified Axnas discloses all of the limitations as set forth above.

While Axnas does not explicitly disclose matching the amount of magnetite to the inorganic coagulants in the waste water of a ratio of 5-30 mass%, it would have been

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obvious to one having ordinary skill in the art as a process of routine optimization to have achieved a similar ratio for the purpose of minimizing the amount of magnetite needed while maintaining the highest purification. Furthermore, applicant has not established a criticality of this range or a showing of unexpected results which require specifically this ratio. Additionally, it has been held that where the general conditions of a claim are disclosed in the prior art (in this case the addition of the magnetite as well as coagulants), discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 7, modified Axnas discloses all of the claim limitations as set forth above.

Horvath further discloses that the first predetermined pH range is in the range of about 9-14 (C4/L45-60).

Regarding claim 10, modified Axnas discloses all of the claim limitations as set forth above. Axnas further discloses using a basic coagulant and magnetite (C3/L5-12).

While Axnas does not explicitly disclose adding the two together, it would have been obvious to one having ordinary skill in the art to have injected them together to optimize the coagulation process such that the magnetic particles become coagulated with the solids coagulated by the basic coagulant.

Regarding claim 11, Horvath further discloses the oxidizing of the wastewater is carried out by adding a first oxidizer being efficient at high pH (C6/L47-67).

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Regarding claim 12, Horvath further discloses the first oxidizer is sodium hypochlorite (C6/L47-67).

Regarding claim 13, modified Axnas discloses all of the claim limitations as set forth above.

Horvath further discloses that the second predetermined pH range is in the range of about 6-9 (C5/L34-60).

Regarding claim 14, Horvath further discloses that the acidic coagulant is introduced after the basic coagulant (C3/L30-45).

Regarding claim 15, Horvath further discloses the acidic coagulant is a salt of iron or aluminum (C5/L34-60 "aluminum salt).

Regarding claim 16, Horvath further discloses using a low pH efficient second oxidizer (C7/L30-60).

Regarding claim 17, Horvath further discloses using ozone as a second oxidizer (C7/L30-60).

Regarding claim 19, modified Axnas discloses all of the claim limitations as set forth above.

While modified Axnas does not explicitly set forth a second oxidization prior to flocculation, it would have been obvious to one having ordinary skill in the art to rearrange the second oxidization of Horvath to have it occur prior to flocculation for the purpose of increasing the amount of material in solution which is capable of being flocculated because the oxidization step would inherently result in some additional materials being precipitated in the wastewater.

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Regarding claim 21, Liu further discloses the separating of the magnetic sludge from the water is carried out by applying a magnetic field across an effluent of the wastewater after the flocculating (C4/L40-65, separator 116 in the figures).

Regarding claim 22, modified Axnas discloses all of the claim limitations as set forth above.

While Axnas modified by Liu does not explicitly disclose the flow rate and floccule size or magnetic field strength, these are all variables optimizable through routine experimentation. Furthermore, commonly known magnetic floc separators typically operate at magnetic field strengths stronger than 0.1 Tesla as is well known in the art. Additionally, the floccule size would be dependant upon the size of magnetic particles and cohesion forces. Accordingly, in the absence of evidence or unexpected results, it is presumed that the process of modified Axnas would in fact produce floccules of less than 10mm. Regarding the linear flow velocity, it would have been obvious to one having ordinary skill in the art to have optimized the flow velocity such that the system operates at an optimal and efficient rate. Furthermore, applicant has not established a criticality of the flow rate or unexpected results occurring from the flow rate. Additionally, it has been held that where the general conditions of a claim are disclosed in the prior art (in this case the flow rate), discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 23, Axnas further discloses the step of dewatering the sludge (C1/L43-45).

Regarding claim 24, Horvath further discloses packaging and storing the sludge (C11/L30-36).

Regarding claims 25 and 26, modified Axnas discloses all of the claim limitations as set forth above.

Horvath further discloses recycling the sludge at a rate of 50% of the total sludge mass being recycled (C8/L30-45).

Accordingly, it would have been obvious to one having ordinary skill in the art to have further modified Axnas to include a sludge recycle to reduce the amount of expensive magnetic starting material required for fluid treatment. Additionally, recycling reactants is well known in the chemical arts.

Regarding claims 27 and 28, modified Axnas discloses all of the claim limitations as set forth above.

While Axnas does not explicitly disclose discharging the water to a sewage system of technological process, it is well known and furthermore, obvious to one having ordinary skill in the art at the time of the invention to have discharged the water to a sewage system of back into the technological process that produced the dirty water in the first place for the purpose of disposing of the water in an effective, environmentally proper manner.

9. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Axnas (USP 5,202,030) in view of Horvath (USP 4,049,545) in view of Liu (USP 5,685,993) and further in view of Liberti et al. (USP 4,477,355).

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Regarding claims 29 and 30, modified Axnas discloses all of the claim limitations as set forth above.

Axnas does not set forth wastewater processing using an ion-exchange catalyst in neutral and also basic form to the water.

Liberti et al. discloses a method for removing and recovering components from wastewater (Abstract) using both a cation exchange and then an anion exchange resin (C2/L60-C3/L13).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Axnas to further include ion-exchange catalyst treatment as taught by Liberti et al. for the purpose of removing ammonium and phosphorous compounds from the wastewater.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID C. MELLON whose telephone number is (571)270-7074. The examiner can normally be reached on Monday through Thursday 7:00am-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797

/D. C. M./
Examiner, Art Unit 1797